



Healthy Bones Matter

What you know about your bones

Bones support your body and allow you to move. They protect your brain, heart, and other organs from injury.

Bone is a living, growing tissue. It is made mostly of two materials: collagen (KOL-uh-juhn), a protein that provides a soft framework, and calcium (KAL-see-uhm), a mineral that adds strength and hardness. This combination makes bone strong and flexible enough to hold up under stress.

Bone releases calcium and other minerals into the body when you need them for other uses.

How bones grow

Think of your bones as a “bank” where you “deposit” and “withdraw” bone tissue. During your childhood and teenage years, new bone is added (or deposited) to the skeleton faster than old bone is removed (or withdrawn). As a result, your bones become larger, heavier, and denser.

For most people, bone formation continues at a faster pace than removal until sometime after age 20.



Think of your bones as a “bank” where you “deposit” and “withdraw” bone tissue.

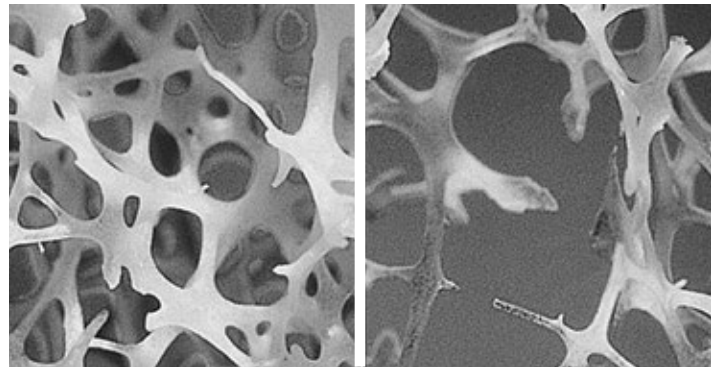
After age 30, bone withdrawals can begin to go faster than deposits. If your bone deposits don’t keep up with withdrawals, you can get osteoporosis (ah-stee-oh-puh-ROH-sis) when you get older. Osteoporosis is a disease in which the bones become weak and more likely to break (fracture). People with osteoporosis most often break bones in the hip, spine, and wrist.

What you need to do now—and why

If you want to be able to make “deposits” of bone tissue and reach your greatest possible peak bone mass, you need to get enough calcium, vitamin D (VAHY-tuh-min dee), and physical activity—important factors in building bone. If you want the strongest bones possible, the best time to build up your “account” is right now—during your childhood and teenage years.

Why should I care about this now?

You may know some older people (your grandparents, aunts or uncles, or friends of your family) who worry about their bones getting weak. You might even know someone who has trouble getting around because they



Normal bone

Bone with osteoporosis

Reprinted from The Surgeon General's Report on Bone Health and Osteoporosis: What It Means to You, 2004.

have broken a bone because of osteoporosis. You might think that this is something that only older people need to worry about.

BUT—you can take action right now to help make sure that as you get older your bones are as healthy as they can be. Eating a balanced diet that includes calcium and vitamin D, getting plenty of physical activity, and having good health habits now can help keep your bones healthy for your whole life.

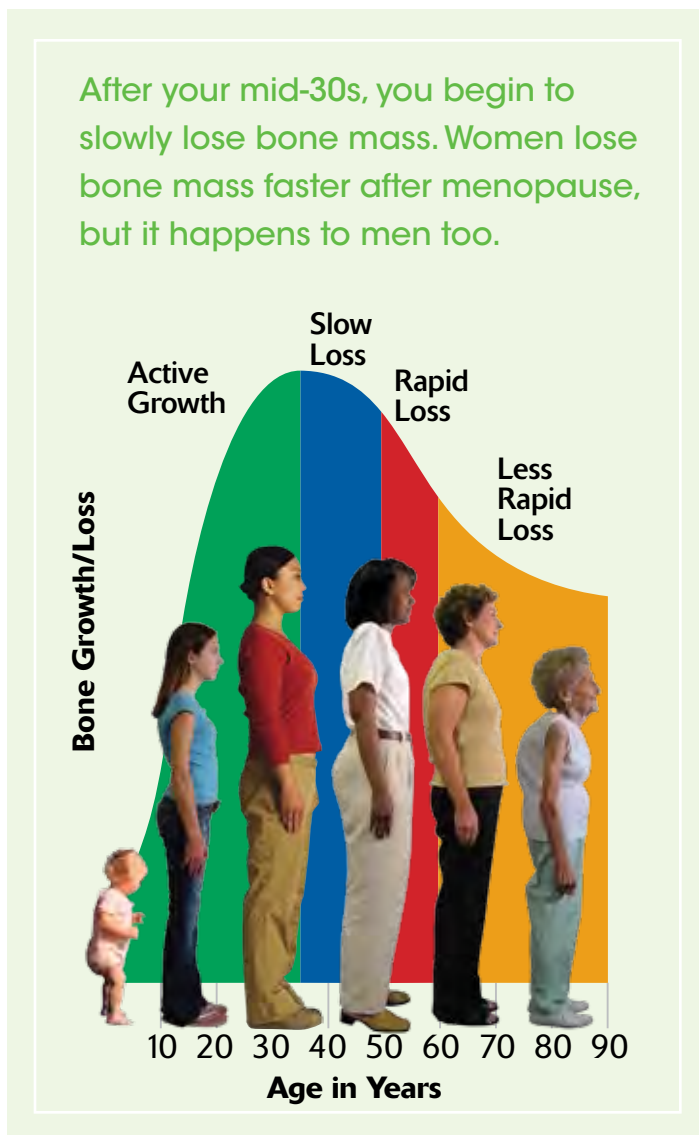
What if I don't take care of my bones now?

If you don't do the best you can now to make your bones strong, you might get osteoporosis when you are older.

Many people have osteoporosis and don't even know it, since bone loss occurs over a long period of time, and it has no symptoms. The first sign of osteoporosis may be a broken bone in the spine, the hip, or the wrist. These fractures can be very painful and make it difficult for a person to walk or do the things they need to do every day.

Does osteoporosis happen to both men and women?

Both men and women can get osteoporosis, but women get it more often because of the changes in hormones (HAWR-mohnz) that occur after menopause (MEN-uh-pawz). Also, women generally have less bone tissue than men. So, it's especially important for girls to build up their bone “bank account” during their teenage years by exercising regularly and getting enough calcium and vitamin D.



Reprinted from The Surgeon General's Report on Bone Health and Osteoporosis: What It Means to You, 2004.

What to do for strong bones— today and tomorrow

Osteoporosis is usually a disease of older people, but you can reduce your risk while you are young by eating the right foods and exercising regularly. Your bones need three major things to grow to their full peak mass: calcium, vitamin D, and physical activity. Making sure you get enough when you are young pays off as you get older, so you can avoid looking stooped over (because of spine fractures) and keep doing the sports and other activities you love. For more information on a healthy diet, see www.choosemyplate.gov/food-groups.

Calcium



Your bones need
three major things
to grow to their
full peak mass:
calcium, vitamin
D, and physical
activity.

Calcium is vital for healthy bones. Between the ages of 9 and 18, it is important to get 1,300 milligrams (mg) of calcium every day. These are the years when your bones are growing rapidly and need a lot of calcium to achieve their peak mass. Food sources of calcium are preferred. You can get calcium from:

- low-fat or fat-free dairy products like milk, cheese, and yogurt
- vegetables like collards, turnip greens, broccoli, Brussels sprouts, mustard greens, and kale
- calcium-fortified foods including some orange juice, some cereals and breads, and fortified soy beverages (often sold as “soy milk”), and tofu (made with calcium salts)
- dietary supplements (if needed).



Sources of Calcium

Food	Portion	Milligrams Calcium
<i>Milk</i>		
• Fat free	1 cup	306
• 1% low fat	1 cup	290
• Lactose-reduced fat free	1 cup	300
<i>Yogurt</i>		
• Plain, fat free	8 oz.	452
• Fruit, low fat	8 oz.	343
• Frozen, vanilla, soft serve	½ cup	103
<i>Cheese</i>		
• Pasteurized process Swiss	2 oz.	438
• Ricotta, part skim	½ cup	335
• Pasteurized process American	2 oz.	323
• Mozzarella, part skim	1½ oz.	311
<i>Calcium-fortified foods</i>		
• Fortified soy beverage	1 cup	368
• Orange juice with calcium	1 cup	300
• Tofu with calcium		
• Cereal with calcium	½ cup	253
• Cereal bar with calcium	1 oz.	236–1,043
• Bread with calcium	1 bar	200
• Whole-grain tortilla with calcium	1 slice	100
	1 tortilla	40
<i>Vegetables</i>		
• Collards, cooked from frozen	½ cup	178
• Kale, cooked from frozen	½ cup	90
• Bok choy, cooked from fresh	½ cup	79
• Broccoli, cooked or fresh	1 cup	61
<i>Other foods</i>		
• Soybeans, green, cooked	½ cup	130
• White beans, canned	½ cup	96
• Almonds, dry roasted	1 oz.	75

Adapted from *Best Bones Forever!* www.bestbonesforever.gov.



Vitamin D

Vitamin D is the “key” that unlocks calcium. It helps your body to absorb calcium from the food you eat. You should get at least 600 international units (IU) of vitamin D every day.

Foods. Milk is almost always fortified with vitamin D, so it’s a good way to get both your calcium and vitamin D every day. Some brands of orange juice, yogurt, breakfast cereals, and other foods also have added vitamin D. Egg yolks and liver also have vitamin D, as do fatty fish, such as salmon, tuna, and mackerel.

Many dietary supplements, like multivitamins supplements, contain vitamin D.

Physical Activity

Everyone needs physical activity. Since bones are living tissues just like your muscles, they respond to physical activity by growing stronger. So it’s important that you get plenty of physical activity every day. This stimulates your bones to increase the production of new bone tissue.

- Strength-building and weight-bearing activities are the best for building healthy bones. Walking, jogging, lifting weights, playing tennis, climbing stairs, jumping, and dancing are good examples.

Since bones are living tissues just like your muscles, they respond to physical activity by growing stronger.

- Activities that are not weight bearing include swimming and bicycling. Although these activities help build and maintain strong muscles and have excellent benefits for your heart and circulation, they are not the best way to exercise your bones.

Get at least 60 minutes of physical activity each day, and be sure some of it is weight bearing. This will improve your overall health and help you maintain a healthy weight, as well as keep your bones strong. If you have any concerns about your health, talk to your doctor or a physical therapist to find out what kinds of activities are right for you.

What else affects bone health?

Other things could affect your bones, for example:

- **Smoking.** Smoking hurts your bones as well as your heart and lungs. Women who smoke have lower levels of estrogen (ES-tru-juhn) compared to women who don’t smoke, and they often go through menopause earlier. Smokers also may absorb less calcium from their diets.

Recipes

Fruit Smash Smoothie

Ingredients:

- 1 cup low-fat or fat-free milk
- Handful of frozen strawberries, apricots, bananas, and fresh raspberries
- Handful of ice cubes

Directions: Mix ingredients in a blender for 1 minute.

Adapted from *Best Bones Forever!* www.bestbonesforever.gov.



Trail Mix

Ingredients:

- 1 cup roasted sunflower seeds
- 1 cup whole-wheat cereal
- 1 cup pretzels
- 1 cup almonds
- ½ cup mixed, dried fruit, sliced
- ½ cup walnut pieces
- ¼ cup yogurt-covered raisins

Directions: Mix all ingredients in a large bowl and serve.

Adapted from *Best Bones Forever!* www.bestbonesforever.gov.



- **Medications.** Some people have to take medicines for certain health problems. Some of these medicines may weaken your bones. For example, taking corticosteroids (kor-ti-ko-STER-oids) (medications prescribed for many diseases, including asthma, Crohn's disease, lupus, and arthritis) can lead to a loss of bone density and fractures. If you have to take any medications for a long period of time, make sure to ask your doctor if they might weaken your bones. Your doctor can suggest ways to limit the damage they may cause.

Definitions

Calcium (KAL-see-uhm). A naturally occurring mineral that is needed for strong bones and teeth.

Collagen (KOL-uh-juhn). A component of bone that gives bones a soft framework.

Corticosteroids (kor-ti-ko-STER-oids). Medications prescribed by a doctor to treat inflammation. Side effects from these medications include bone loss.

Estrogen (ES-tru-juhn). The primary female hormone.

Hormones (HAWR-mohnz). Products of living cells that circulate in body fluids (such as blood) and affect the activity of other cells in the body.

Menopause (MEN-uh-pawz). The natural cessation of menstruation occurring usually between the ages of 45 and 55.

Osteoporosis (ah-stee-oh-puh-ROH-sis). The most common bone disease. If you have osteoporosis, your bones lose minerals like calcium, become fragile, and break easily.

Vitamin D (VAHY-tuh-min dee). The vitamin that helps your body use calcium. Vitamin D is often added to milk, yogurt, some cereal and orange juice, and some kinds of fish.

For more information:

NIH Osteoporosis and Related Bone Diseases National Resource Center

Toll free: 800-624-BONE

Email: NIHBoneInfo@mail.nih.gov

Website: www.bones.nih.gov

Check out these websites:

- **Milk Matters Campaign:** www.nichd.nih.gov/milk
- **Best Bones Forever!™:** www.bestbonesforever.gov
- **Surgeon General's Report on Bone Health and Osteoporosis. What It Means to You:**
www.niams.nih.gov/Health_Info/Bone/SGR/surgeon_generals_report.asp

For information on calcium and Vitamin D, visit the NIH Office of Dietary Supplements:

- **Calcium Quick Facts:** www.ods.od.nih.gov/factsheets/Calcium-QuickFacts
- **Vitamin D Quick Facts:** www.ods.od.nih.gov/factsheets/VitaminD-QuickFacts

For information on physical activity, visit:

- **Centers for Disease Control and Prevention: Physical Activity Guidelines:** www.cdc.gov/physicalactivity/everyone/guidelines/children.html
- **Healthfinder.gov: Physical Activity:**
www.healthfinder.gov/prevention/ViewTopic.aspx?topicID=22&areaID=5&TopicContentID=258
- **President's Council on Fitness, Sports, & Nutrition:** www.fitness.gov
- **Kids.gov: Health, Fitness, and Safety:**
www.kids.usa.gov

For information about a balanced diet, visit:

- **ChooseMyPlate.gov:** www.choosemyplate.gov/food-groups
- **Healthfinder.gov: Eat Healthy:** www.healthfinder.gov/prevention/ViewTopic.aspx?topicID=21&areaID=5&TopicContentID=106

This fact sheet was made for you by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), a part of the U.S. Department of Health and Human Services' National Institutes of Health. For more information about the NIAMS, call the information clearinghouse at 301-495-4484 or toll free at 877-22-NIAMS (226-4267) or visit the NIAMS website at www.niams.nih.gov.



National Institute of
Arthritis and Musculoskeletal
and Skin Diseases

NIH Publication No. 11-7577 (B)
August 2012